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# **Apprenticeship: The Intention to Quit and the Role of Secondary Jobs in It.**

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## **Abstract**

This paper analyzes the effects of a secondary job on the intention to quit apprenticeship in Germany. For the empirical approach the representative German firm-level study “BIBB Survey Vocational Training from the Trainees Point of View 2008” conducted by the Federal Institute for Vocational Education and Training is used. In this study 5901 apprentices were interviewed during their second year of apprenticeship. The probit regressions show a higher intention to quit if apprentices need a secondary job to cover their living costs.

*JEL classification: J22, J24, J38*

*Keywords: Apprenticeship, dropout, quit, secondary job, income*

# 1 Introduction

Worldwide the German dual system of vocational education and training (VET) is taken as best-practice example for school-to-work transition, especially in times of high youth unemployment. Following Ryan (2001) the success of school-to-work transition is the result of nationally specific institutions. Taking Germany's dual system of VET, young people can apply to employers after they have at least finished the compulsory school. Once accepted by an employer both parties sign a contract for an apprenticeship. Usually within 3 years the apprentices acquire basic skills by learning occupation-specific things, alternately at their workplace and at a vocational school. After the successful completion apprentices obtain a formal vocational qualification with which they can either apply for further education or enter the labour market as skilled workers. Comparing the German system to countries like the United States or the United Kingdom, especially the promotion of hiring school-leavers directly into employment allowed Germany in the past to concentrate on the improvement of general education, vocational preparation and job matching (Ryan, 2001). Nonetheless, over the past years the German VET system called into doubt its efficiency. More and more German students choose to study after school instead of entering the VET system. Additionally to the decreased number of signed apprenticeship contracts, the cancellation rate of apprentices increased from 21.5% in 2008 to 25.3% in 2013 (BIBB, 2015). On the one hand, a cancellation can be a change, such as the choice of a new occupation or a new firm. On the other hand, it can be identified with an upgrade to university or ultimately with an actual dropout (Bessey and Backes-Gellner, 2015). However, the latter one ends often with an entry into the labour market without a vocational degree, which in turn is connected to a higher probability of long-time unemployment and low income prospects in the future. For example, Schöngen (2003) states, that among the dropouts especially women and men with a secondary general school leaving certificate or with no vocational degree have bad future prospects. Following Wieland (2015) individuals in Germany without a vocational degree have a three times higher probability to become unemployed than individuals with vocational qualifications. Furthermore, Ryan (2001) confirms that vocational education and apprenticeship increase the future prospects of participants, such as employment. Taking into account that almost all firms in Germany and almost 60% of the German employees (including apprentices and skilled workers) belong to the "German Mittelstand"<sup>1</sup> Germany ensures its own economic output with its recruitment system of skilled workers (BMW, 2014). From this follows, besides worse future prospects for former apprentices, a dropout causes also problems for firms as well as for the economy itself. Therefore, the avoidance of quits and especially of dropouts represents a topic of great interest to the research community.

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<sup>1</sup>Small and medium businesses.

There is only a scarce amount of literature, which analyses apprenticeship quits multivariately. The existing research finds, for example, income, the migration background and the level of education as reasons for quits and especially for real dropouts (e.g. Bessey and Backes-Gellner, 2015 and Bednarz, 2014). But, unlikely to the recent literature on apprenticeship quits, I do not only consider the income itself as a determinant. Instead of this my contribution to the existing literature is to estimate the effect of a secondary job on the intention to quit. Even if the reason for holding a secondary job is the income itself (Shisko and Rostker, 1976) and furthermore a decisive determinant for dropouts (Bessey and Backes-Gellner, 2015), an additional job might lead to further problems, which accelerate quit probabilities in general.

To investigate the effect of a secondary job on the intention to quit, I use the “BIBB Survey Vocational Training from the Trainees Point of View 2008” conducted by the Federal Institute for Vocational Education and Training (BIBB). It is a representative German firm-level study of 5901 apprentices in 6 German federal states. The design of the BIBB survey provides another enrichment to the literature. While the apprentices in the BIBB survey were interviewed during their second year of apprenticeship, the existing research used data which cover information on already happened drop outs. With this I am able to compare whether or not the reasons for quits or dropouts differ when apprentices were interviewed during or after their apprenticeship.

The results of the probit regressions show an increasing intention to quit apprenticeship when apprentices hold a secondary job. Further, men’s intention to quit increases strongly when they have to earn extra money to cover their living costs. Besides this, I find a higher quit intention for apprentices with migration background and for apprentices with bad math marks. For older apprentices, apprentices with a high training allowance and for apprentices who work in their favourite profession, I notice lower lower intentions to quit.

The paper is organized as follows. In section 2 the paper gives an overview about the existing literature and motivates the research question. Section 3 provides data and variable description. Section 4 presents the empirical framework and discusses the results. Section 5 concludes the empirical analysis.

## **2 Motivation**

There is only a scarce amount of existing literature, which investigates the quitting behaviour of apprentices in a multivariate way. Instead of this, there are more descriptive studies. Because of this I rely on literature about quitting behaviour in general as well as on apprenticeship dropouts and educational choices.

Widely known, an individual will choose under a variety of choices the one, which yields the highest net present value. Assuming additionally, like Bessey and Backes-Gellner (2015), that apprentices have the possibility to revise an earlier educational choice after learning more about it, they can conclude, that a former choice seems to be unprofitable because of lower expected benefits or higher expected costs. So, an apprentice who suffers from unexpected burdens/costs quits apprenticeship if the net present value of staying in apprenticeship falls below a certain utility threshold. Contrary to other literature on quits or dropouts I take the need of a secondary job instead of the income as a determinant for quits and estimate its effect on the intention to quit apprenticeship. I suspect that the need for a secondary job increases the intention to quit. More precisely, the need for a secondary job, which is due to a low training allowance can create a double burden on apprentices that makes a quit more likely. Focusing on the reasons for holding a secondary job, Shisko and Rostker (1976) find that the lower the earnings from the primary job, the higher the probability to take on a secondary job. Winters (2010) additionally finds that teachers in the United States work 1 hour less in their primary job when they are holding a second job. He concludes that teacher moonlighting may have harmful effects on education. Income on the other hand, is also a determinant for apprenticeship dropouts. Bessey and Backes-Gellner (2015) find evidence for the effect of income on the probability to drop out by analyzing 3 different ways of educational choice revision, namely dropping out, changing and upgrading from apprenticeship. They show, that the decision to drop out of apprenticeship is driven by financial considerations. In their analysis opportunity costs, defined as a ratio of apprenticeship wage relative to the wage for unskilled workers, as well as financial distress have higher hazards of dropping out of training. Further, Schöngen (2003) finds descriptively among other determinants that financial distress is one reason to drop out of apprenticeship. Considering furthermore the occurred time constraints for apprentices with an additional job, apprentices might be forced to spend less time on their apprenticeship as soon as they hold a secondary job (e.g. preparation for exams, homework etc.). This can result in performance pressure due to less available time to meet the requirements for obtaining a vocational degree (mental stress). Additionally, physical problems can occur due to the burden of 2 jobs. Both burdens, mental and physiological, can make quits more likely (Schaufeli and Bakker, 2004).

Another part of the literature confirms the importance of job satisfaction and its relation to income and to the quitting behaviour of individuals. While Freeman (1978) and Hamermesh (1977) started to introduce job satisfaction into the research of labour economics in general, further researchers have focused on which extend job satisfaction influence the quitting intention or behavior of individuals (Clark, 2001; Levy-Garboua et al., 2007 and Green, 2010). With the aim to test the wealth maximization theory of job quitting behaviour on the German Socioeconomic Panel, Levy-Garboua et al. (2007)

use job satisfaction to construct an indicator which captures how the expected present value of the current job compares to an alternative (estimated residuals of job satisfaction equation). They use the level of job satisfaction itself but also the residuals of job satisfaction to measure the effect of job satisfaction on the intention to quit. They confirm the higher the job satisfaction itself as well as the job satisfaction residual, the lower the intention to quit. Green (2010) compares the performance of well-being indicators with the level of job satisfaction and finds that job satisfaction and the probability of quitting are negatively correlated. Further, Beicht and Krewerth (2010) measure which factors influence the satisfaction with remuneration during apprenticeship. By using logit regressions they find out that a remuneration 20% below the class average and the need for a secondary job to cover basic needs decrease the satisfaction with remuneration among German apprentices. Linking the research findings on job satisfaction to the holding of a secondary job, I state the hypothesis that the need for a secondary job leads to a more unsatisfied apprentice, which consequently can result in lower job satisfaction and in turn to a higher quit intention among apprentices. Further to that, Seidel (2016) investigates subjective job characteristics which are closely related to overall job satisfaction and analyzes their effect on the intention to quit apprenticeship. Here, for example job security signals increase on the one hand job satisfaction and lower the intention to quit apprenticeship on the other hand.

However, to capture the complex decision of quitting or especially of dropping out in general and the role of a secondary job in it, I have to identify further possible determinants. For this I refer to the existing literature on the determinants of dropouts in general. Like other studies on dropout behaviour of apprentices (Beicht and Walden, 2013, Rohrbach-Schmidt and Uhly, 2015, Bessey and Backes-Gellner, 2015) Bednarz (2014) confirms for Australian apprentices, that a higher level of previous schooling comes along with a lower probability of dropping out. This could, for example, be due to better decision-making abilities (Cutler and Lleras-Muney, 2008). Further, Beicht and Walden (2013) find evidence for a negative relationship of dropping out of apprenticeship and being in one's favourite occupation. Related to this aspect Beicht and Walden (2013) mention, that the level of school education is decisive. An individual with less schooling might be forced to accept a certain training place, because of a lack of available options. Hence, this could lead more often to a mismatch and to an increasing propensity to drop out. Further, there is evidence for the importance of migration status. Taking Switzerland as example, Stalder and Schmid (2006) explain that apprentices in Switzerland with migration background terminate their training more often than the Swiss youth. Additionally, the probability to find a new training place is for ex-apprentices who are born in Switzerland twice as much as for apprentices with migration background. Reasons for this are language capabilities, a missing network or prejudices against foreigners. Several others studies, such as Beicht and Walden (2013)

Schöngen (2003) and Dostie (2010), confirm this positive relation between a dropout and migration background. The literature also considers regions and their relation to dropouts. Since, due to different regional labour and apprenticeship market conditions the intention to end an apprenticeship can vary across regions. Given a good supply-demand ratio for apprentices on the regional labour and/or on the apprenticeship market, the probability of finding a better alternative increases and so the intention to end an apprenticeship (Bessery and Backes-Gellner, 2008).

## 3 Data and Descriptive Statistics

### 3.1 Data

This empirical analysis is based on the “BIBB Survey Vocational Training from the Trainees Point of View 2008” conducted by the Federal Institute for Vocational Education and Training (BIBB). With this representative German firm-level study 5901 apprentices (in 340 classes and at 205 schools) from 15 common training occupations in Germany were interviewed during their second year of apprenticeship in six federal states.<sup>2</sup> The survey contains the design, procedures, basic conditions and quality criteria of apprenticeship. Additionally, it includes information about the educational background, sex, age, migration background and the training allowance of apprentices. One advantage of the data set is that the apprentices were interviewed during their second year of apprenticeship and not afterwards. I can overcome the shortcoming of wrong answering by former apprentices, who sometimes lie about or overemphasize the real reason for quitting in order to justify their decision afterwards. This enables me to compare whether the reasons for quitting differ when apprentices were interviewed during apprenticeship or afterwards. Since, the apprentices were interviewed during their second year of apprenticeship, apprentices that already quit within the first year of apprenticeship cannot be considered. However, I am not really interested in mismatch problems which are mostly getting obvious during the first year, observing the apprentices during their second year seems right. At this point the apprentices are already familiar with the training company itself and with their chosen occupation. See for detailed information on the data set Krewerth et al. (2011).

There are 3 variables of high interest. The variable, which captures the intention to quit, the variable for the secondary job as well as the income variable.

To capture the quitting behaviour of apprentices, I use the question: “Have you ever seriously thought about to drop out of apprenticeship?” as a dummy variable. This dummy

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<sup>2</sup>The six federal states are: Hamburg, Hesse, North-Rhine-Westphalia, Baden-Württemberg, Brandenburg, Thuringia

variable takes on the value one, when an individual answered with “Yes”. Clearly, the used indicator overestimates the real probability of dropping out. Not every thought of dropping out has to lead to an actual dropout. Four outcomes are possible: An apprentice can finish, can upgrade (study), can change (occupation or firm) or can really drop out of apprenticeship. So, due to the data limitations, I decided rather to talk of quit intentions instead of dropout probabilities when I discuss the results. Although, I am not able to identify the real outcome, this not necessarily has to be a disadvantage. An extensive psychological as well as economic literature shows that intentions are good indicators and positive related to the actual behaviour (e.g. Ajzen and Fishbein, 1980; Igbaria and Greenhaus, 1992; Steel and Ovalle, 1984; Gordon and Denisi, 1995; Shields and Ward, 2001). Because of this, I assume first of all that quit intentions are positively related to the actual quitting behaviour and further positively related to real dropouts.

My main explanatory variable of interest is “Secondary job”. It contains information about the engagement in a secondary job and states the reason for the secondary job. The outcomes are the following: (1) No secondary job (reference category), (2) secondary job, need money for living, (3) secondary job, need money for extra wishes and (4) secondary job, need money for both. A secondary job can thereby be, for example, babysitting or also a job in the own occupational field. Moreover, it has to be regular. Relying on the literature review apprentices with a secondary job should have a higher intention to quit.

In order to gather the effect of the training allowance on the intention to quit, I use the information on the training allowance per month (net income). I create 3 income dummies (EUR <401, EUR 401-600 and EUR 601-1500). Like mentioned before income is one driving factor to drop out of apprenticeship and further a main factor to take on a secondary job. To capture the unbiased effect of the secondary job, I have to control for the income itself.

Of great interest as well is the indicator for the quality of the training (“VET-Rating”), which will be taken as proxy for job satisfaction. During the interview the apprentices were asked to evaluate their training by giving a grade from 1 - 6, whereby 1 stands for very good and 6 for very bad. On the one hand I assume that the need for a secondary job leads to a more unsatisfied apprentice, which consequently can result in lower job satisfaction and in turn to a higher quit intention among apprentices. On the other hand, there is also the possibility that the dissatisfaction during apprenticeship leads to the holding of a secondary job in order to find an alternative to the current apprenticeship.

Further, I follow the reviewed literature on important determinants for quits. I use the 15 training occupations offered by the data set, but for better interpretation I use also

an aggregated occupation variable (manufacturing, personal related services, business related services and IT-services).<sup>3</sup> This types of occupation differ for example by income, female share or level of schooling, which in turn can have different effects on the quitting behaviour of apprentices within each type of occupation. I also control for the fact, whether someone is in his originally wanted occupation (dream occupation) or the chosen apprenticeship is for example just a compensation because of a lack of opportunities. Once an apprentice have chosen a disliked apprenticeship because of a lack of opportunities, she/he might be waiting or searching for a better alternative during the current apprenticeship. Dummies for the number of all employees (including the interviewed apprentice) at the training location as well as individual's characteristics like school performance, age, sex, region and the migration background are included as well. The level of school performance is thereby considered in two ways. I use 6 school degree dummies and further the grade in math and in German.<sup>4</sup> For detailed information see also the summary statistics (Table A.1 in the Appendix).

## 3.2 Descriptive Statistics

A deeper look into the data shows that almost 35% of the apprentices in the sample have already thought about to quit apprenticeship. While among the men only 30.7% want to quit, this applies for 40.9% of the women (see, Table 1).

**- Insert Table 1 about here -**

Furthermore, Table 2 shows some differences in the quitting behaviour between the types of occupation (manufacturing, personal related services, business related services and IT-services). Only 20.6% of the apprentices from IT-service occupations thought about to quit, on the contrary this applies for 31.4% of the manufacturing apprentices and for 33.8% of the apprentices in bussiness related service occupations. For personal related service occupaions I observe 48.1% apprentices.

**- Insert Table 2 about here -**

On the one hand, the differences in the quitting behaviour can be explained with tougher working conditions (e.g. working time and physical burdens). On the other hand, when comparing to apprentices in the IT sector and considering in more detail the characteristics of the occupation types, Table 3 shows a higher share of females, a lower level of schooling and lower earnings. For all three determinants the recent literature finds higher quitting probabilities and especially higher dropout probabilities among apprentices (Bessey and Backes-Gellner, 2015).

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<sup>3</sup>Classification of occupations are built on the KldB 2010

<sup>4</sup>School degree dummies: no degree (used as reference category), special needs school, secondary general school, intermediate school, upper secondary school, other.

- Insert Table 3 about here -

Focusing on the main explanatory variable of interest, the secondary job, the data in Table 4 reveal that 7.5% of all the apprentices have a secondary job to cover their living costs (e.g. rent and food), 8.1% have one to afford extra wishes and 10.2% of the apprentices work additionally to have enough money for both. Summing all three reasons up, more than one quarter of the apprentices is holding a secondary job to earn some extra money. Furthermore, 12.4% of the apprentices who thought about to quit needed money for living, while only 6.9% of them needed money for extra wishes.

- Insert Table 4 about here -

This descriptive statistics indicates, that the need for extra money has some influence on the intention to quit, especially when apprentices need the money to cover their living costs. To confirm this descriptive results the following section estimates the effect of a secondary job on the intention to quit multivariately.

## 4 Empirical Framework and Results

### 4.1 Estimation Method and Tests

I use a probit regression for the empirical approach:

$$Pr(y = 1|X) = \Phi(X\beta), \quad (1)$$

where  $\Phi$  is the cdf of the standard normal distribution,  $X$  a matrix of explanatory variables and  $\beta$  the corresponding parameter values. However, instead of observing the net utility of staying in training directly, I can only observe the actual outcome of whether or not an apprentice wants to quit. Therefore, the use of a probit regression approach is suitable.

I assume an individual has once chosen the educational pathway that yields the highest net present value, but like Bessey and Backes Gellner (2015) I also assume that apprentices have further the possibility to revise an earlier educational choice after learning more about it. They can conclude, that a former choice seems to be unprofitable because of lower expected benefits or higher expected costs, which in turn increases their intention to quit.

The underlying latent model is:

$$y_i = \begin{cases} 0, & y_i^* \geq \tau \\ 1, & y_i^* < \tau \end{cases} \quad (2)$$

$\tau$  represents a utility threshold and the individual's utility of apprenticeship ( $y^*$ ) is displayed by:

$$y_i^* = \beta_0 + \beta_1 x_{i1} + \dots + \beta_k x_{ik} + \varepsilon_i = x_i' \beta + \varepsilon_i, \quad (3)$$

where  $\varepsilon$  is i.i.d. with a standard normal distribution and independent of  $x_i'$ :

$$\varepsilon | x_i \sim N(0, 1). \quad (4)$$

$x_i'$  contains a vector of individual and firm specific characteristics of apprentice  $i$  and  $\beta$  is the corresponding parameter vector.

Finally, an apprentice's intention to quit increases when the utility of staying in apprenticeship falls below the threshold  $\tau$ , which follows from equation (2) and (3).

The upcoming results of the above explained probit regressions will be interpreted by using the average marginal effects. For each observation the marginal effect is computed for a discrete or partial change of a variable while all other variables are held constant at their observed values and then the average over all marginal effects is computed. Basically, it is the average size of the effect across all observations (Long and Freese, 2014). Instead of using the average marginal effect there is also the possibility of using the marginal effect at means. This effect represents the marginal effect of a variable for an average individual. As I am not convinced that the marginal effect of a discrete or partial change is representative, I favour like Long and Freese (2014) to use for the interpretation of my results the average marginal effect.

In addition to the 4 chosen probit regression specifications, which will be explained in detail in section 4.2, I perform several robustness checks. At first, I run all models with and without robust standard errors, but do not find any evidence for misspecification. In a next step I cope with the probability of heteroskedasticity across the sample. My existing suspicion of heteroskedasticity can have various causes such as the level of education, sex or the migration background for example. It might be that apprentices with a higher level of education make better decisions because of more information on future prospects or women can have a higher tendency to quit due to family plans, such as getting children. The current literature on heteroskedasticity in binary models suggests in order to find the source of heteroskedasticity to use heterogenous choice models (Williams, 2009 and Keele and Park, 2006). In contrary to ordinary least square regressions, binary models with heteroskedasticity report not only incorrect standard errors, but also biased and inconsistent parameters. To check for the assumed heteroskedasticity I run a variety of heterogenous probit models, but find neither in the magnitude of the average marginal effects nor in the niveau of the significance levels large differences. Because of this and because I am not aware of a misspecified variance equation, I decided to rely on my results from the standard probit model. By this I follow Keele's

and Park's (2006) suggestion to use the heterogenous probit model only when the cause of heteroskedasticity is clear and can be specified correctly. Both authors checked the performance of heterogenous probit models by using Monte Carlo simulations and find out that (1) any kind of misspecification in the choice or variance equation and (2) any kind of measurement error lead to worse biased estimates than in standard probit models. Even under perfect conditions they show that a heterogenous probit model is less efficient than the standard probit model.<sup>5</sup>

## 4.2 Results

Table 5 introduces 4 different variants of the above explained probit regression. Model B and D contain the variable "VET-Rating". For this variable, which can also be taken as a good proxy for job satisfaction, the data as well as the literature review reveal high explaining power. First of all, both the variable "Secondary job" and the variable "VET-Rating" are positive related to the intention to quit (Green, 2010 and Schöngen, 2003). Further, they are correlated with each other. The correlation between both of them is of high relevance for the estimated effect of holding a secondary job on the intention to quit. On the one side, it is possible that the need for a secondary job leads to a more unsatisfied apprentice, which consequently can result in a worse VET-Rating. Hence, a quit could follow. On the other side, a dissatisfied apprentice could use a secondary job to find a better alternative. Once finding an alternative the apprentice quits apprenticeship if the net present value of quitting is higher compared to staying in apprenticeship. In the first case the variable "VET-Rating" contains explaining power, that is originally connected to the variable "Secondary job". The effect of holding a secondary job is underestimated. In the second case the effect of the "Secondary job" on the quit intention is overestimated and the effect of "VET-Rating" is underestimated. This implies that for both variables the true average marginal effect of the "Secondary job" and the "VET-Rating" lies between the one's shown in model A and B as well as between C and D. Furthermore, model A and model B contain each occupation as a dummy. On the contrary, I include in model C and D the 4 types of occupation (manufacturing (reference category), personal related services, business related services and IT-services). Additionally, all specifications control for the firm size and for the highest school degree.

**- Insert Table 5 about here -**

Starting with the income of apprentices which is decisive for holding a secondary job and for quitting apprenticeship (Shisko and Rostker, 1976 and Bessey and Backes-Gellner, 2015), the results in all models confirm, that compared to the lowest income class (EUR < 401), the intention to quit is less likely for apprentices with a relatively

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<sup>5</sup>All robustness checks are available on request.

high training allowance. In model A apprentices with a training allowance between EUR 401 - 600 per month have a 4.2 percentage points lower intention to quit, the quit intention of apprentices with EUR 601 - 1500 per month decreases by 12.3 percentage points. It could be concluded, that a quit is actually driven by income problems and not really by the fact of a secondary job. However, the effect of a secondary job (reason: need money for living) on the intention to quit remains significant, when I control for income. All four models support the hypothesis, that especially the need for a secondary job to cover living costs comes along with a higher intention to quit compared to apprentices without a secondary job. To find evidence for a significant difference between the 3 reasons for holding a secondary, job equality tests are applied ((1) Secondary job, need money for living; (2) Secondary job, need money for extra wishes; (3) Secondary job, need money for both). The performed Wald tests for equality show: The reason "Secondary job, need money for living" differ at a 0.1%-level from the reasons "Secondary job, need money for extra wishes" and "Secondary job, need money for both". However, there is no significant difference between outcome 2 (Secondary job, need money for extra wishes) and outcome 3 (Secondary job, need money for both). Summing up, it is not only important whether an apprentice holds a secondary job in general, but also the reason for holding it. The results indicate that especially a secondary job that is held to afford extra wishes has no harmful effect on the quitting behaviour, while secondary jobs that are used to cover living costs do so. Taking model A from Table 5 apprentices have a 19.1 percentage points higher propensity to think about a quit when they need money for living and almost 5 percentage point higher intention to quit when they need money for living and extra wishes. Although I have no real indicator for it, a reason for the higher intention to quit could be the exposed physical and mental burdens on apprentices by trying to meet the expectations of the vocational school, the training firm and the secondary job at the same time, and seeing no way out, due to financial distress. An apprenticeship with a secondary job has less time for preparation to meet the required performance at school and in the firm. This can result in worse grades and also in greater performance pressure, which might force an apprentice to quit apprenticeship. Schaufeli and Bakker (2004) support this supposition. In their research on burnout they find a strong and consistent positive relationship between job demands (i.e. work overload) and burnout as well as between burnout and health problems, whereby the relationship between job demands and health problems was mediated by the burnout. Another reason for a higher intention to quit could be the frustration of needing two jobs to cover living costs, while apprentices in other occupations or for example unskilled workers in the same occupation earn more. There is also the possibility that apprentices already had the intention to quit before they decided to hold a secondary job. They might use the secondary job to orientate new. Even, if the secondary job increases the intention to quit as well, it is not the causing factor in this case. However, assuming that an apprentice with an already existing intention to quit is some sort of unsatisfied with

his apprenticeship, I control for this by using the variable “VET-Rating”. By including the variable “VET-Rating” in model B the effect of the secondary job on the quit intention decreases by almost 5 percentage points, but remains with an increase of 14.4 percentage points significant at a 0.1%-level (“Secondary job, money for living”). Further, model B reveals the high explanatory power of the variable “VET-Rating”. One grade worse increases the intention to quit by 16.0 percentage points. The result can be confirmed by the reviewed literature, that states, the higher the job satisfaction, the lower the probability to quit (e.g. Clark, 2001).

Overall the data in model A and model B show a higher intention to quit for female apprentices, apprentices with migration background, for apprentices with bad math grades and for apprentices with a secondary job. For older apprentices, apprentices with a high training allowance and for apprentices who are working in their dream occupation the intention to quit is less likely.

In model C and model D I include the type of occupation instead of using the 15 occupations as dummies. First of all, I recognize a different quitting behaviour by the type of occupation. Compared to manufacturing occupation apprentices from personal related service occupations have a higher intention to quit (13-14 percentage points). The other categories show ambiguous results. In model C the intention to quit is significantly higher in IT-service occupations (7.0 percentage points) and in model D the intention is higher in business related service occupations (5.1 percentage points). The ambiguous results could be due to data limitations. The selection of occupations are common in Germany, but every category misses occupations which is why statements across the types of occupations can only point out possible relations. For all other variables the results of model C and D show, except for sex, almost the same pattern like already described in model A and B. While female apprentices in model A and B are more likely to think about a quit, this does not apply for female apprentices in model C and D. There is no significant difference between male and female apprentices left. An explanation are the earlier mentioned characteristics within the types of occupation. Personal related service occupations have a higher share of female apprentices and are further characterized by a low level of school performance and a low income. All three factors lead to a higher intention to quit and are now fully or partly explained by the variable “type of occupation”. It remains the possibility of occupational segregation instead of differences between sex. If women rather sort into occupations with lower income and tougher working conditions the quitting behaviour probably has nothing to do with differences between sex, but with differences between the occupations.

### 4.3 Interaction Terms

To test the overall significance of the variable “Sex” I interact each type of occupation with the sex to see whether women and men differ in their quitting behaviour within a type of occupation. However, the results do not support the hypothesis of a overall different quitting behaviour between women and men. This strenghtens the hypothesis of occupational segregation. The findings are in line with Rohrbach-Schmidt and Uhly (2015). With a multilevel analysis on cancellations of training contracts in Germany they conclude that even when controlling for individual characteristics and regional conditions there are still differences in the probability of cancellation between occupations.

Further, I test whether the intention to quit apprenticeship varies over the different reasons of holding a secondary job within each sex group. More precisely, I use the contrast of margins by estimating the differences between all pairs of holding a secondary job to check for differences in the behaviour. The results show that especially male apprentices are more prone to quit when they hold a secondary job. Figure 1 shows a highly significant increase by 25.43 percentage points when male apprentices earn extra money to cover their living costs compared to male apprentices without a secondary job. For the same group of female apprentices I find an increase of 11.83 percentage points.

**- Insert Figure 1 about here -**

Besides this, the intention for male apprentices to quit increases by 8.18 percentage points, if they earn extra money for living cost and extra wishes, while it is for female apprentices insignificant. Overall, this indicates that the engagement in a secondary job plays a much more bigger role for male apprentices, when they are thinking about a quit. For female apprentices it seems to be more one reason among others. A more important reason for female apprentices could be family plans, such as getting children. Whereas male apprentices might use their secondary job more often to orientate new. See for detailed results Table A.3 in the appendix.

The descriptive statistics reveals that apprentices from manufacturing occupations (31.8% of all apprentices of this type of occupation) and apprentices from personal related service occupations (28.3% of all apprentices of this type of occupation) hold relatively often a secondary job compared to apprentices from business related- and IT-service occupations (18.6% and 22.9% within the type of occupation). See for this also appendix Table A.2. Assuming that the working conditions differ between occupations in terms of effort, an additional job can have different effects on the quitting behaviour within each group of apprentices. Therefore, I interact the variables “Secondary job” and “Type of occupation” and analyze whether a secondary job, that is held by apprentices from a specific type of occupation, makes a quit more likely. Then, holding a secondary job, although the apprenticeship already requires high physical and/or mental effort, could

make a quit more likely compared to occupations with lower required physical and mental effort. However, the estimated contrasts of margins for apprentices with a secondary job presented in Figure 2, show no significant differences between the types of occupation. See for detailed results Table A.4 in the appendix.

- Insert Figure 2 about here -

## 5 Conclusion

In this paper, I analyzed the effect of a secondary job on the intention to quit apprenticeship. More precisely, I investigated whether apprentices revise their educational choice and quit due to unexpected burdens caused by a secondary job. I used data of German apprentices during their second year of apprenticeship provided by the Federal Institute for Vocational Education and Training (BIBB).

The probit regressions show a higher intention to quit if apprentices hold a secondary job to earn extra money for living costs. Even after controlling for income, which is the main factor to pick up a secondary job, there is still a significant effect left. This enhances the suspicion that extra burdens caused by a secondary job can lead to higher quitting rates. The results show also a different quitting behaviour between men and women. Especially men want to quit when their training allowance is insufficient to cover the living costs and a secondary job is inevitable. An explanation why the need for a secondary job is in particular for women less connected to the thought of quitting, could be the importance of other determinants such as family plans. On the other hand, men might more often see the secondary job as a better alternative to the current apprenticeship.

However, due to the data limitation some problems have to be noted. Since, the survey was conducted in 2008 the question remains whether the discussed effect of a secondary job on the intention to quit is still relevant nowadays. Although the average training allowance has increased from 657 to 802 Euro gross per month in West Germany and from 567 to 737 Euro gross per month in East Germany since 2008, the left net training allowance after the deduction of social security contributions remains low. Looking at the training allowance of 20 chosen occupations in Germany in 2014, I find several occupations with an training allowance less than 600 Euro net per month (Beicht, 2015). Comparing this with the data set of 2008, the descriptive statistics show that a great part of apprentices, who hold a secondary job to cover living cost earned less than 600 Euro net. This supports the relevance of the topic. However, to be sure whether my results and implications still matter or become less or may be more important a new survey, which

evaluates the same topics and survey group like in 2008, should be conducted. Another point is the causality of the shown results. Does the need for a secondary job really increase the intention to quit of apprenticeship or do omitted variables bias the shown results? I control for several variables that are, according to recent literature, important determinants for quits. Even though I control for them and especially for income, which is decisive to hold a secondary job and to quit apprenticeship, the effect of the secondary job remains highly significant. Unfortunately, I have no direct information on the parents financial wealth and the support they offer during apprenticeship, which in turn could make a completion more likely. Nonetheless, I can cover this with the level of education which is closely related to the parents level of education and wealth (Black et al., 2005). All in all, this strengthens the assumption of causality. However, due to the cross sectional data structure, I cannot control for unobserved individual characteristics like higher demands, resilience and health status at the beginning of the apprenticeship. A panel analysis would help to control for this individual characteristics. Monthly or yearly conducted interviews of apprentices over the time of apprenticeship could solve the problem of unobserved variables. Nevertheless, the robustness checks as well as the comparison to other literature display a convincing picture. There is also the possibility that apprentices already had the intention to quit before they decided to hold a secondary job. They might use the secondary job to orientate new. Even, if the secondary job increases the intention to quit as well, it would not be the causing factor. In this case there would be a problem of reverse causality. However, assuming that an apprentice with an already existing intention to quit is some sort of unsatisfied with its apprenticeship, I can cope with this problem by including the “VET-Rating” which represents a proxy for job satisfaction. However, even if there is still doubt about the causality itself, the positive relation of holding a secondary job and the quit intention is obvious. This especially proves that it is not enough to control only for income or financial distress, but to check which series of consequences follow from a low allowance during apprenticeship. Further, while the apprentices of this data set were interviewed during their apprenticeship other research focus on data from former apprentices who have already ended their apprenticeship. This enables me to find out whether determinants on the intention to quit differ from the determinants of real quits. However, I cannot find much evidence for differences. In both cases, a bad school performance, migration background or not working in its favourite occupation make a quit more likely. Older apprentices and apprentices with a high training allowance are on contrary less likely. Surprisingly unlike to previous research findings, I find no significant effect for the level of schooling, but evidence for the importance of earlier school performance. An explanation could be the quiet high level of schooling among the observed apprentices. Almost 80% of them obtained a intermediate school leaving certificate and higher. On the contrary, they differ more in their school performance. There are two further shortcomings. The first one is the missing variable to measure the effect of the extra burden that is caused by the

secondary job, exactly. To solve this, future research plans contain an own evaluation of apprentices in Schleswig-Holstein. Similiar to the questionnaire used by the BIBB, I will ask the apprentices whether the thought of dropping out are caused by extra burdens due to the secondary job. The second shortcoming could be interpreted as a problem, but at the same time could be seen as a key for policy recommendation. The apprentices were asked during their second year of apprenticeship: “Have you ever seriously thought about to drop out of apprenticeship?”, but, not every thought of dropping out has to lead to an actual dropout. Four outcomes are possible: An apprenticeship can finish the apprenticeship, can upgrade, can change or can really drop out. So, due to the data limitations I decided rather to talk of quit intentions instead of dropout probabilities. Although, I am not able to identify the real outcome, this not necessarily has to be a disadvantage. An extensive psychological as well as economic literature shows that intentions are good indicators and positive related to the actual behaviour (e.g. Ajzen and Fishbein, 1980; Igbaria and Greenhaus, 1992; Steel and Ovalle, 1984; Gordon and Denisi, 1995; Shields and Ward, 2001). Especially for political recommendations, observing apprentices intention to quit could help to identify problems at an earlier stage. So overall, the chosen indicator is a good tool to analyze possible determinants of quits or especially of dropouts.

Finally, in order to avoid extra burdens on apprentices which accelerate especially the intention to drop out, implementing a basic income for apprenticeship could be one recommendation. This basic income should enable apprentices to pay at least for rent and food. To avoid a lower involvement of firms in the training of apprentices the government could support the firms with government subsidies.

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Table 1: Intention to quit by sex

<b>Intention to quit</b>	<b>Sex</b>		
	Men	Women	Total
No	69.3%	59.1%	65.3%
Yes	30.7%	40.9%	34.7%
N	2023	1798	4621

Table 2: Intention to quit by type of occupation

<b>Intention to quit</b>	<b>Type of occupation</b>				<b>Total</b>
	Manufacturing	Personal related services	Business related services	IT-services	
No	68.6%	51.9%	66.2%	79.4%	65.3%
Yes	31.4%	48.1%	33.8%	20.6%	34.7%
N	1766	892	1619	344	4621

Table 3: Characteristics by type of occupation

	<b>Type of occupation</b>				
	Manufacturing	Personal related services	Business related services	IT-services	Total
<b>Sex</b>					
Men	96.0%	30.0%	33.0%	94.5%	61.1%
Women	4.0%	70.0%	67.0%	5.5%	38.9%
N	1766	892	1619	344	4621
<b>Income</b>					
< 401 Euro	49.1%	57.2%	30.5%	15.1%	41.6%
401 - 600 Euro	36.9%	41.6%	52.1%	66.0%	45.3%
601- 1500 Euro	14.0%	1.2%	17.5%	18.9%	13.1%
N	1766	892	1619	344	4621
<b>Highest school degree</b>					
No degree	0.8%	0.8%	0.4%	0.0%	0.6%
Special needs school	0.6%	0.4%	0.4%	0.0%	0.5%
Secondary general school	27.0%	26.1%	14.6%	1.5%	20.6%
Intermediate school	60.0%	60.1%	40.0%	24.1%	50.3%
Upper secondary school	11.2%	12.3%	43.9%	73.0%	27.5%
Other degree	0.5%	0.2%	0.7%	1.5%	0.6%
N	1766	892	1619	344	4621

Table 4: Intention to quit by reason for a secondary job

<b>Reason</b>	<b>Intention to quit</b>		
	No	Yes	Total
No secondary job	77.0%	68.7%	74.2%
Secondary job, money for living	4.9%	12.4%	7.5%
Secondary job, money for wishes	8.7%	6.9%	8.1%
Secondary job, money for both	9.3%	11.9%	10.2%
N	3018	1603	4621

Table 5: Intention to quit apprenticeship

	Model A	Model B	Model C	Model D
No secondary job (reference category)				
Secondary Job, money for living	.1906*** (.0266)	.1444*** (.0250)	.1990*** (.0267)	.1501*** (.0251)
Secondary Job, money for extra wishes	-.0031 (.0242)	.0124 (.0230)	-.0043 (.0242)	.0111 (.0231)
Secondary Job, money for living and wishes	.0463* (.0220)	.0337+ (.0205)	.0505* (.0221)	.0352+ (.0207)
Female	.0549** (.0205)	.0546** (.0193)	.0038 (.0180)	.0057 (.0169)
Migration	.0476* (.0188)	.0441* (.0176)	.0431* (.0188)	.0380* (.0176)
Age: 15-19 (reference category)				
Age: 20-24	-.0152 (.0155)	-.0145 (.0145)	-.0135 (.0155)	-.0121 (.0145)
Age: 25-30	-.1404*** (.0267)	-.1306*** (.0254)	-.1399*** (.0267)	-.1316*** (.0253)
Region: West Germany	.0193 (.0167)	.0080 (.0157)	.0198 (.0164)	.0097 (.0155)
Grade: German	-.0140 (.0091)	-.0122 (.0086)	-.0105 (.0091)	-.0094 (.0086)
Grade: Math	.0294*** (.0071)	.0211** (.0067)	.0273*** (.0071)	.0192** (.0067)
Income: < 401 Euro				
Income: 401 - 600 Euro	-.0419* (.0187)	-.0182 (.0174)	-.0532** (.0167)	-.0343* (.0156)
Income: 601 - 1500 Euro	-.1228*** (.0272)	-.0814** (.0261)	-.1432*** (.0242)	-.1008*** (.0235)
Dream occupation (reference category)				
Interesting Occupation	.1052*** (.0154)	.0661*** (.0153)	.0891*** (.0154)	.0519*** (.0152)
Alternative Occupation	.2062*** (.0211)	.1297*** (.0204)	.1909*** (.0208)	.1177*** (.0200)
Compensation	.3814*** (.0291)	.2271*** (.0294)	.3660*** (.0285)	.2167*** (.0285)
Do not know	.3322*** (.0362)	.1817*** (.0351)	.3238*** (.0364)	.1769*** (.0353)
VET-Rating		.1599*** (.0062)		.1602*** (.0062)
Manufacturing (reference category)				
Personal related services			.1385*** (.0227)	.1255*** (.0212)
Business/Business-related services			.0303 (.0203)	.0507** (.0193)
IT-services	24		.0700* (.0310)	.0189 (.0280)
N	4621	4621	4621	4621
Pseudo R2	0.1278	0.2174	0.1278	0.2174

Notes: Table contains average marginal effects and standard errors in parentheses.

Model A-D control for firm size and highest school degree.

Model A and B contain each occupation as a dummy.

+  $p < 0.10$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Figure 1: Predictive margins for quit intentions by sex and secondary job

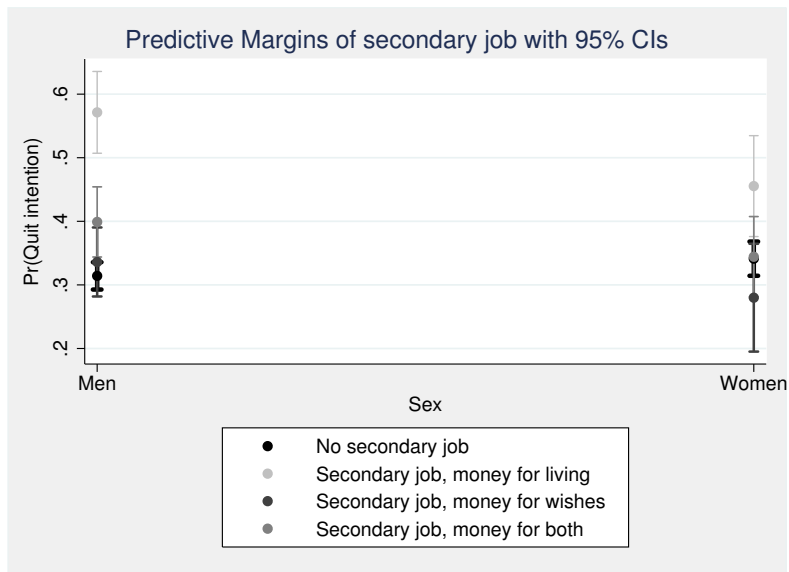
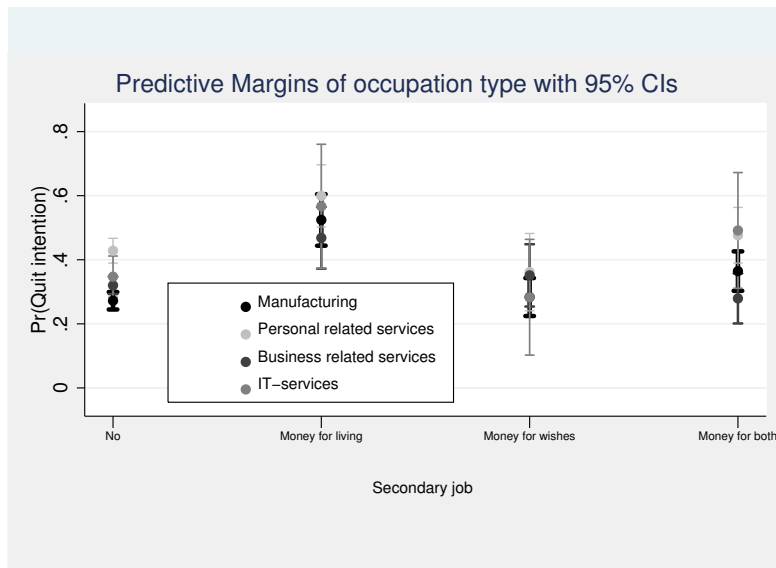


Figure 2: Predictive margins for quit intentions by type of occupation and secondary job



## A Appendix

Table A.1: Summary Statistics

<b>Variables</b>	<b>MEAN</b>	<b>SD</b>	<b>MIN</b>	<b>MAX</b>
<b>Intention to quit</b>	0.35		0	1
<b>Secondary job</b>				
No secondary job	0.75		0	1
Secondary job, need money for living	0.07		0	1
Secondary job, need money for wishes	0.08		0	1
Secondary job, need money for both	0.10		0	1
<b>Sex</b>				
Female	0.39		0	1
<b>Migration background</b>	0.16		0	1
<b>Age</b>				
Age: 15-19	0.38		0	1
Age: 20-24	0.56		0	1
Age: 25-30	0.06		0	1
Region: West Germany	0.75		0	1
<b>Highest school degree</b>				
No degree	0.01		0	1
Special needs school	0.00		0	1
Secondary general school	0.21		0	1
Intermediate school	0.50		0	1
Upper secondary school	0.27		0	1
Other degree	0.01		0	1
Grade: German	2.73	0.76	1	6
Grade: Math	2.74	0.96	1	6
<b>Income</b>				
Income: < 401 Euro	0.42		0	1
Income: 401-600 Euro	0.45		0	1
Income: 601-1500 Euro	0.13		0	1
<b>Evaluation of chosen occupation</b>				
Dream job	0.29		0	1
Interesting occupation	0.42		0	1
Alternative occupation	0.17		0	1
Compensation	0.08		0	1
Do not know	0.04		0	1
<b>VET-Rating</b>	2.61	0.93	1	6
<b>Type of occupation</b>				
Manufacturing	0.39		0	1
Personal related services	0.19		0	1
Business related services	0.35		0	1
IT-services	0.07		0	1
<b>Number of observations</b>				4621

Table A.2: Secondary job by type of occupation

Reasons for secondary job	<b>Type of occupation</b>				Total
	Manufacturing	Personal related services	Business related services	IT-services	
No secondary job	68.2%	71.7%	81.4%	77.0%	74.2%
Secondary job, money for living	8.0%	9.9%	5.9%	6.4%	7.5%
Secondary job, money for wishes	11.6%	5.7%	5.5%	8.7%	8.1%
Secondary job, money for both	12.2%	12.7%	7.2%	7.8%	10.2%
N	1766	892	1619	344	4621

Table A.3: Intention to quit apprenticeship by sex and secondary job

<b>Sex@Secondary job (Interaction term)</b>	<b>Model E margins/se/ci95</b>
(Secondary job, money for living vs. No secondary job) Men	.2543 *** .0347 .1863, .3224
(Secondary job, money for living vs. No secondary job) Women	.1183 ** .0420 .0359, .2007
(Secondary job, money for wishes vs. No secondary job) Men	.0209 .0275 -.0330,.0748
(Secondary job, money for wishes vs. No secondary job) Women	-.0662 .0485 -.1613,.0289
(Secondary job, money for both vs. No secondary job) Men	.0818 ** .0284 .0261, .1375
(Secondary job, money for both vs. No secondary job) Women	.0032 .0357 -.0667,.0731
Joint	67.98 ***

Notes: Table reports average marginal effects. Estimations from model E are based on Model C  
<sup>+</sup>  $p < 0.10$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Table A.4: Intention to quit apprenticeship by occupation and secondary job

<b>Occupation@Secondary job (Interaction term)</b>	<b>Model F margins/se/ci95</b>
(Personal related services vs. Manufacturing) No secondary job	.1550 (.0254) *** .1052, .2048
(Personal related services vs. Manufacturing) Secondary job, money for living	.0728 (.0625) -.0498, .1954
(Personal related services vs. Manufacturing) Secondary job, money for wishes	.0772 (.0688) -.0577, .2121
(Personal related services vs. Manufacturing) Secondary job, money for both	.1143 * (.0562) .0042, .2245
(Business related services vs. Manufacturing) No secondary job	.0475 * (.0215) .0054, .0896
(Business related services vs. Manufacturing) Secondary job, money for living	-.0554 (.0640) -.1809, .0701
(Business related services vs. Manufacturing) Secondary job, money for wishes	.0671 (.0584) -.0474, .1817
(Business related services vs. Manufacturing) Secondary job, money for both	-.0886 (.0539) -.1944, .0171
(IT-services vs. Manufacturing) No secondary job	.0744 * (.0348) .0063, .1426
(IT-services vs. Manufacturing) Secondary job, money for living	.0414 (.1040) -.1623, .2452
(IT-services vs. Manufacturing) Secondary job, money for wishes	-.0006 (.0957) -.1882, .1870
(IT-services vs. Manufacturing) Secondary job, money for both	.1296 (.0985) -.0635, .3227
Joint	56.93 ***

Notes: Table reports average marginal effects. Estimations from model F are based on Model C  
<sup>+</sup>  $p < 0.10$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

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